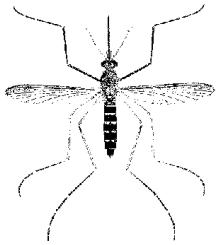
Clark County
2000
Surveillance Report



Introduction

The 2000 mosquito control season was the third year for the Clark County Mosquito Control District / Multnomah County Vector Control contract. The contract provides Clark County with laboratory support for adult mosquito surveillance to aid in mosquito control. The primary goal of the contract is the identification of potential mosquito sources by trapping, identifying and counting the numbers of adult mosquitoes present and determining their comparative population levels. A secondary goal of the contract is to monitor *Culex tarsalis* populations for encephalitis. This report contains an explanation of the surveillance program and the results of the 2000 trapping season.

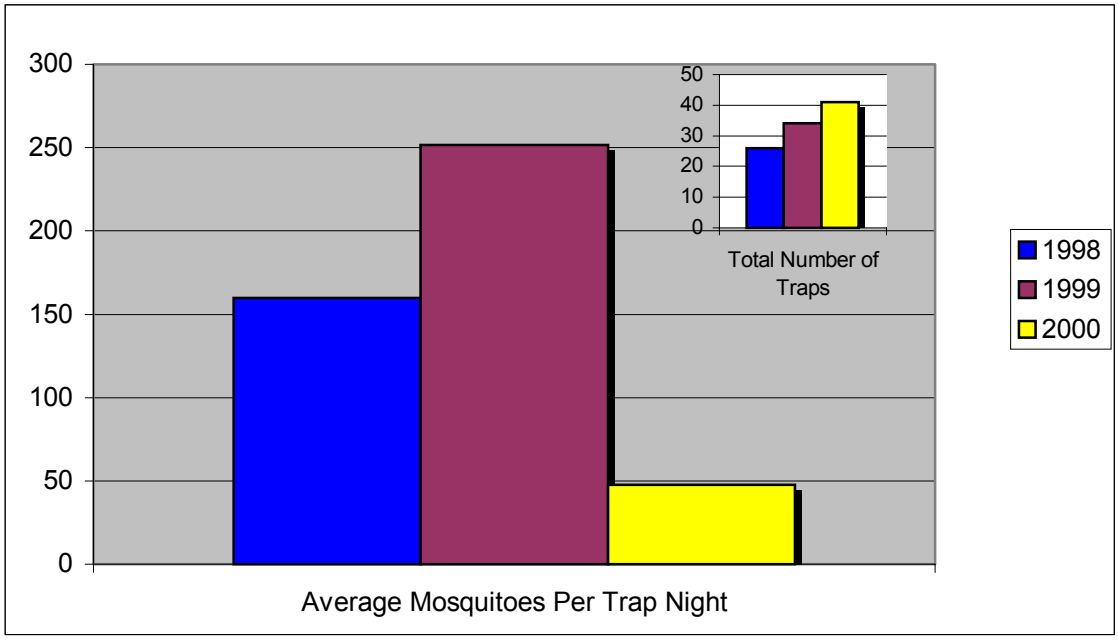
This season six carbon dioxide baited Encephalitis Virus Surveillance (EVS) traps were used to monitor the local mosquito population. The EVS traps mimic a person or large animal standing under a tree breathing, by releasing CO_2 as an attractant. The traps were set throughout the county for one night every other week June through September. These traps are set in the late afternoon and the samples are collected the following morning then returned to the lab for identification. The result is a clean sample of live female mosquitoes. This is critical because only female mosquitoes yield viral isolates and they must be alive to be tested for encephalitis.

An added benefit of using EVS traps is mobility. EVS traps can easily be set, retrieved, and then moved to another spot. This minimizes the amount of time they are in the field and available for theft. It also allows us to cover a broader area with fewer traps. Generally trapping concentrates on the Ridgefield and West Vancouver area, then the South East Vancouver area, Camas and Washougal areas on the next trap night. To monitor historical populations and population fluctuations throughout the half of the traps are set in the same location every month and the others are moved around to target problem areas as they arise.

County Wide Trapping Results

This control season appeared to be very successful and the trap numbers were down. A total of 41 traps (compared to 34 in 1999 and 26 in 1998) were set on nine different trap nights (see appendix 1). This year, as with the last two years, trapping concentrated in the Ridgefield, Vancouver, and Camas-Washougal areas of Clark County. Overall, the average numbers of mosquitoes collected per trap were down, just over 81% from the 1999 season (Fig. 1).

Figure 1. Average number of mosquitoes trapped in Clark County.



County wide the most prevalent species were *Aedes vexans*, *Ae sticticus*, *Culex tarsalis*, *Cx pipiens*, and *Anopheles punctipennis*. The most significant change was the 97% drop in the number of *Ae sticticus* trapped. In comparison, the numbers of *Ae vexans* trapped decreased by 43%, *An punctipennis* by 22%, *Cx tarsalis* by 41%, while the number of *Cx pipiens* were 2.5 times higher (Fig. 2) than the year before.

Figure 2. Average numbers of floodwater mosquitoes trapped in Clark County.

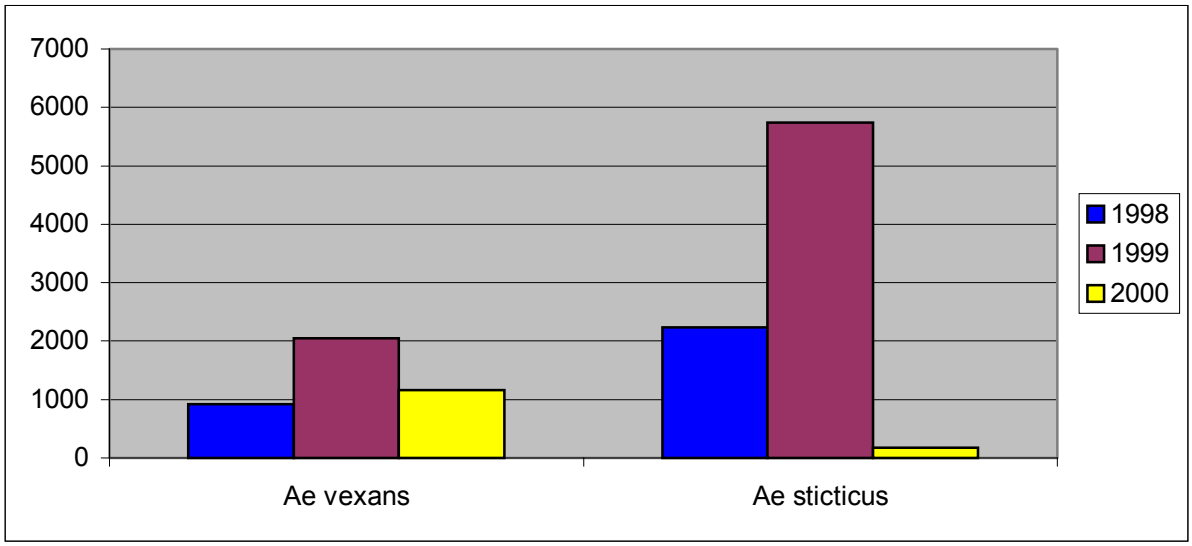
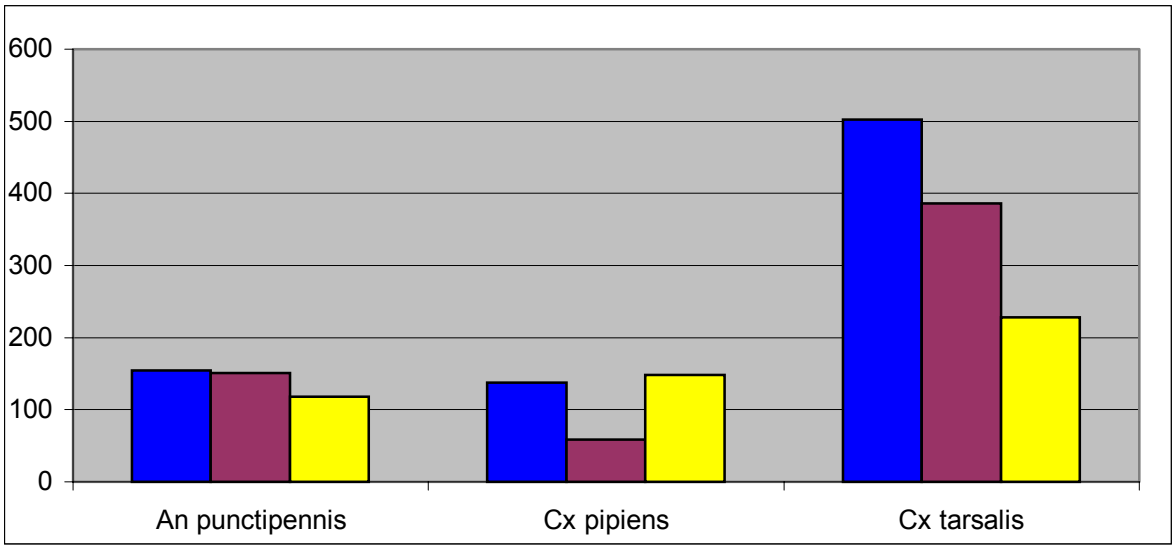


Figure 2. continued. Average numbers of mosquitoes trapped in Clark County, by species.



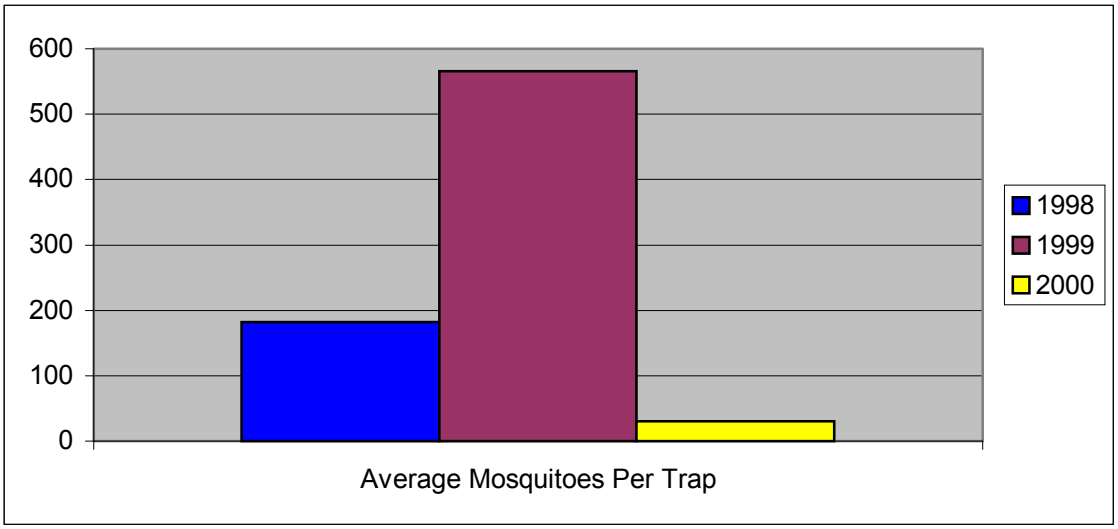
Ridgefield Trapping Results

During the 2000 season five traps were set in and 4 traps set outside the Ridgefield Wildlife Refuge, all traps that could be impacted by the refuge are reported here. Overall the average numbers of mosquitoes trapped in the Ridgefield area was much lower this season compared to the last two seasons. In the areas trapped outside the refuge the numbers of mosquitoes trapped were not high, however many of those traps are quite a distance from any apparent larval source and could be impacted by the refuge.

In traps located outside the refuge, the numbers of mosquitoes trapped per night averaged in the mid to upper teens. The highest yield of floodwater mosquitoes trapped off the refuge was 18 collected in the trap at 207 3rd St. in Ridgefield. This trap also caught 2 *An punctipennis*. There are no sources for either species on this property. The other interesting trap site near the Ridgefield Refuge was located south of the town of Ridgefield on Krieger Road near the bridge just north of 179th St (August 3rd). This trap was interesting in the variety of mosquitoes sampled: 3 *Ae sticticus*, 3 *An freeborni*, 3 *An punctipennis*, 2 *Cx pipiens*, 12 *Cx tarsalis*, and 2 *Coquillettidia perturbans*, pointing to a variety of sources in the vicinity

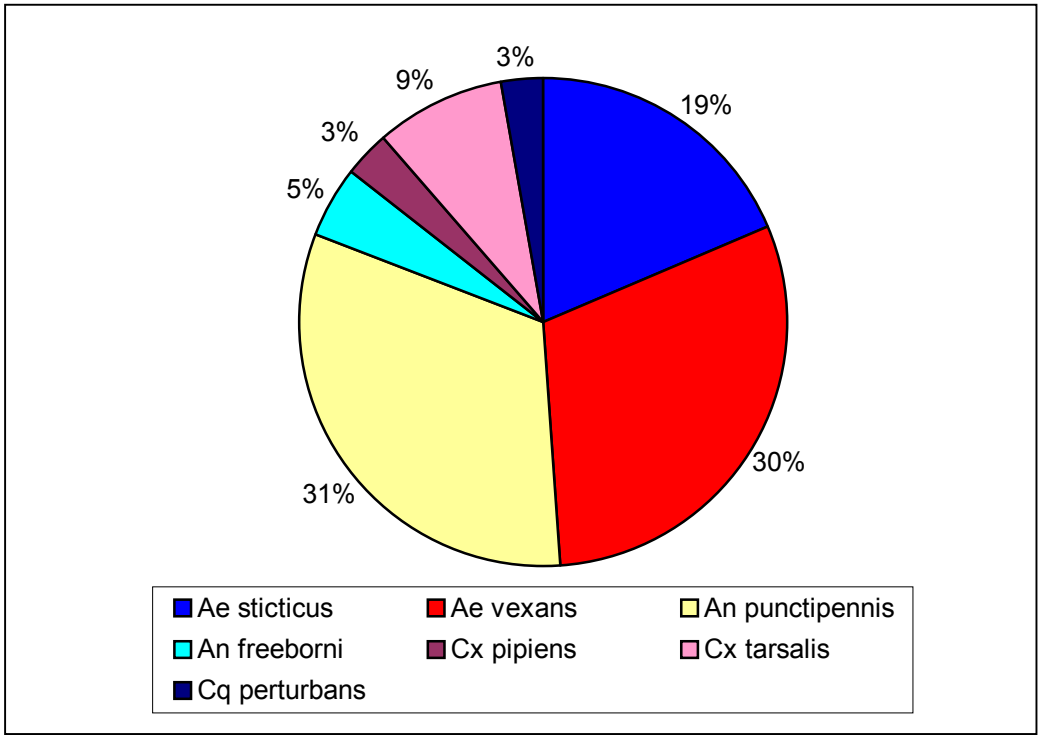
On the Ridgefield Wildlife Refuge the average numbers of mosquitoes per trap dropped from 566 in 1999 to 30.2 this season. The history for the refuge is shown in Fig. 3. In 1998, floodwater mosquitoes accounted for approximately 88% of

Figure 3. Average numbers of mosquitoes trapped in the Ridgefield area.



the mosquitoes sampled and in 1999 98%. With the low numbers of floodwater mosquitoes trapped on the refuge this season they accounted for only 49% of the sample (Fig. 4). The most significant finding was the increase in *Anopheles*; 30 *An punctipennis*

Figure 4. Species make up of the Ridgefield traps.



were collected in the Carty Unit trap on August 30th, this is the highest number of *Anopheles* trapped at one time to date. Furthermore it is important to note that the numbers of *An freeborni* are increasing on the Carty Unit. Though currently the numbers are relatively low (an average of .17 for 1998, .67 for 1999 and 1.4 for 2000, with an actual range of 1 to 5) due to its vectorial capacity this mosquito is very important and should be closely monitored.

This year the only traps set on the Ridgefield Wildlife Refuge were located on the Carty Unit. In the future it would be beneficial to continue setting the Carty trap on a monthly basis, but include a second site further south, possibly the River S unit, to enrich the data collected.

Vancouver Trapping Results

Trapping in the Vancouver area this season targeted, monthly, three areas of the city. They were an area along the Columbia River near the Water Resources Education Center, the Vancouver Lake area, and the Salmon Creek Greenway. A total of 18 traps were set over the course of the season. This increase in the number of traps set is due in part to trapping Water Resources for the first time. Overall, the average numbers of mosquitoes per trap was down from the last several years (Fig. 5). A drop in the numbers of floodwater mosquitoes trapped was the most significant change (Fig. 6).

Figure 5. Average numbers of mosquitoes per trap in the Vancouver area.

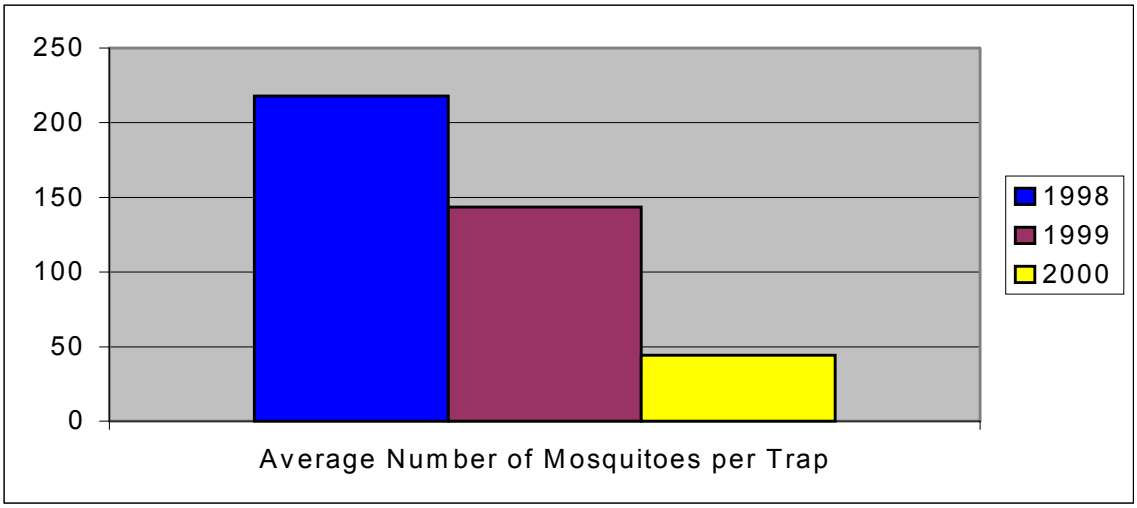
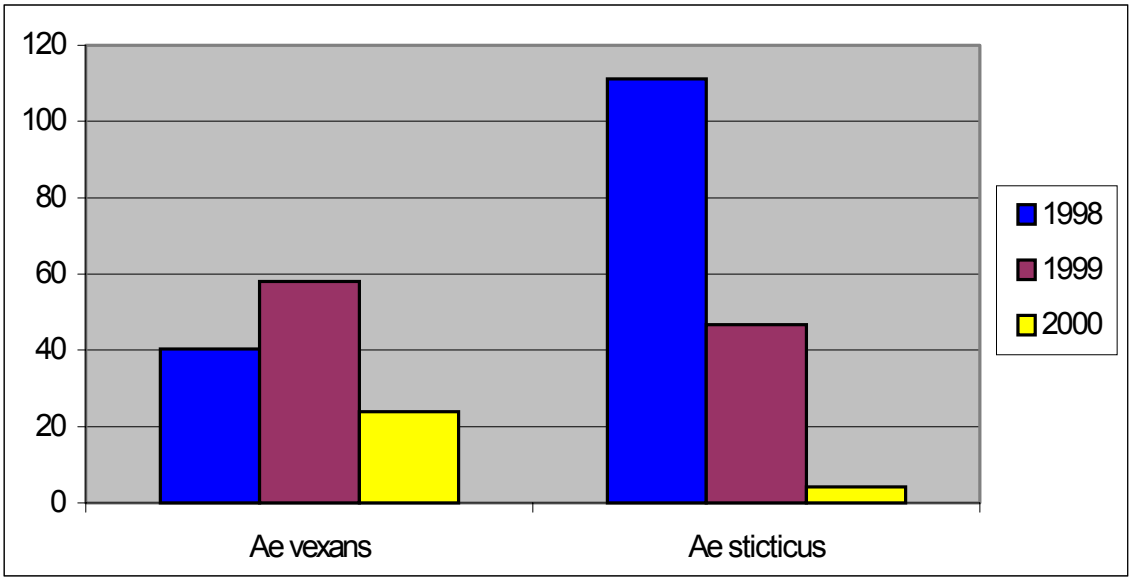


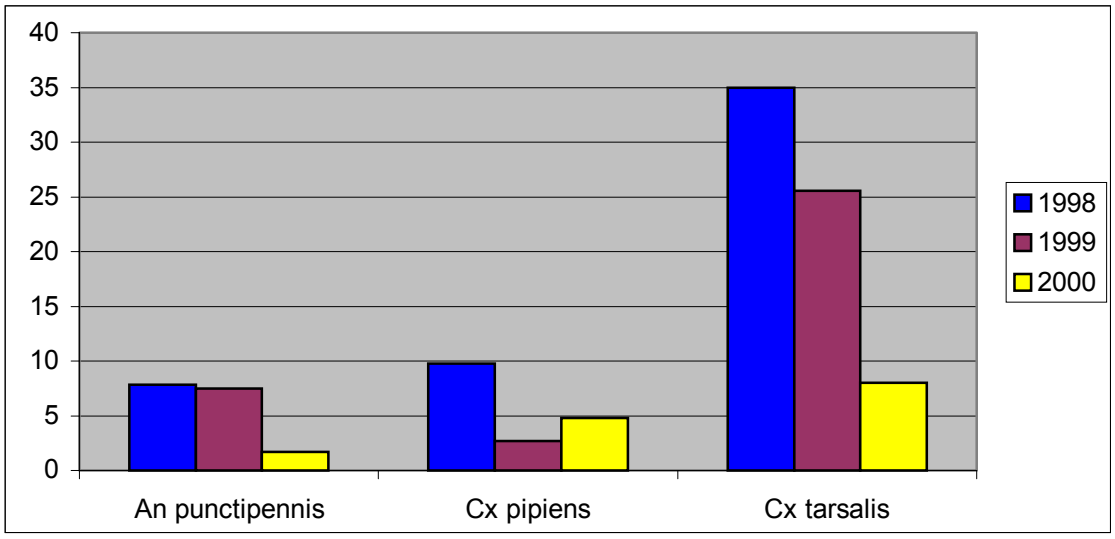
Figure 6. Average numbers of floodwater mosquitoes per Vancouver trap.



Though lower this season than in the past three seasons, the area around Vancouver Lake produced more floodwater mosquitoes than elsewhere in the Vancouver area. The numbers of *Ae sticticus* in particular were lower than in the past two seasons. Though the numbers of floodwater mosquitoes trapped at Frenchman's Bar were the down from last season (peaked at 112 on July 6th), they were still higher than the numbers collected elsewhere, with the exception of a new site on the Game Commission land (243 on July 6th). The floodwater mosquitoes were already present in June when I began trapping and had all but died out by mid September.

The other mosquitoes trapped in significant numbers were the summer mosquitoes *An punctipennis*, *Cx pipiens*, and *Cx tarsalis* (Fig. 6). Though the

Figure 6. Average numbers of summer mosquitoes trapped in Vancouver.



numbers were down, *Cx tarsalis* in particular were trapped in significant numbers on August 3rd (45 at the Vanalco entrance, 36 near the boat launch at the end of La Frambois Rd). The number of *Cx pipiens* (43 trapped on August 23rd) were also high at the site across from the Water Resources Education Center. The *Anopheles* were trapped in low numbers in July and the highest on Game Commission land July 6th.

Another interesting point is the trap set at View Road. Historically this has been a neighborhood that has complained loudly about the mosquito problem coming off of the shoreline of Vancouver Lake, which lies just below them. Though not trapped previously, one trap was set there this year. The result was 4 *Cx tarsalis*, 1 *An*

punctipennis, 1 *Cs incidens*, 1 *Cq perturbans*, and 1 *Ae sticticus*. While onsite I spoke with some of the local residents, all of which said that this years mosquito problem had improved greatly.

With overall numbers down at the routine trapping locations this season and higher in the new areas it would be beneficial to trap other areas in addition to Frenchman's Bar, Vancouver Lake, and Salmon Creek. Areas of interest include the bike trail near Water Resources, the Game Commission land, and the manmade wetlands around Vanalco.

Camas and Washougal Trapping Results

This season the only traps set in Camas were located at the 3rd St. Loop off the gravel road behind the park. In Washougal, the Steigerwald Refuge and the trees across from the industrial area along the river (across from Reed Island) were trapped. The numbers of mosquitoes trapped in Washougal were down significantly while the numbers of mosquitoes trapped in Camas were up significantly at the 3rd street loop.

The trapping results from Camas are shown in Figs. 7 and 8.

Figure 7. Average numbers of floodwater mosquitoes trapped in Camas.

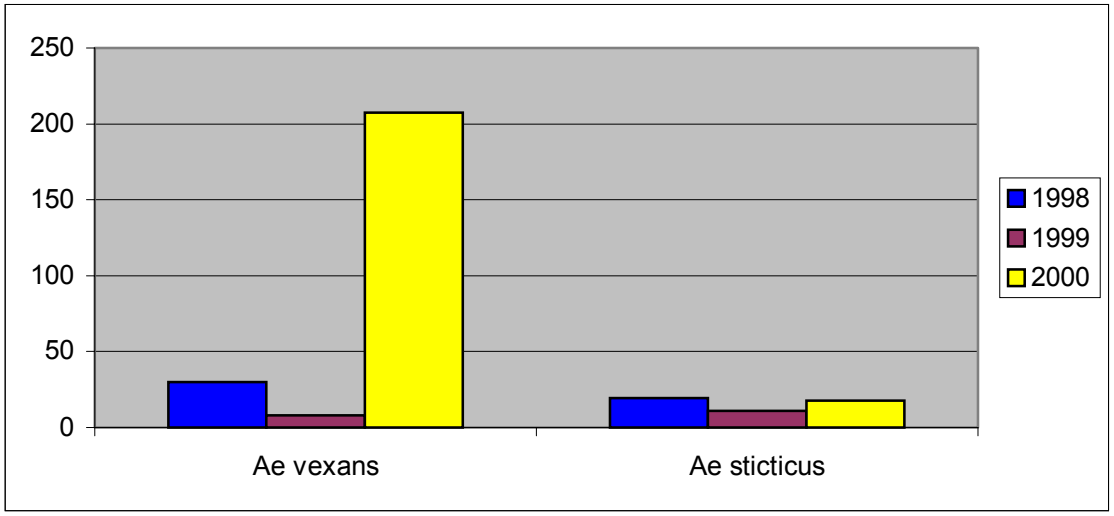
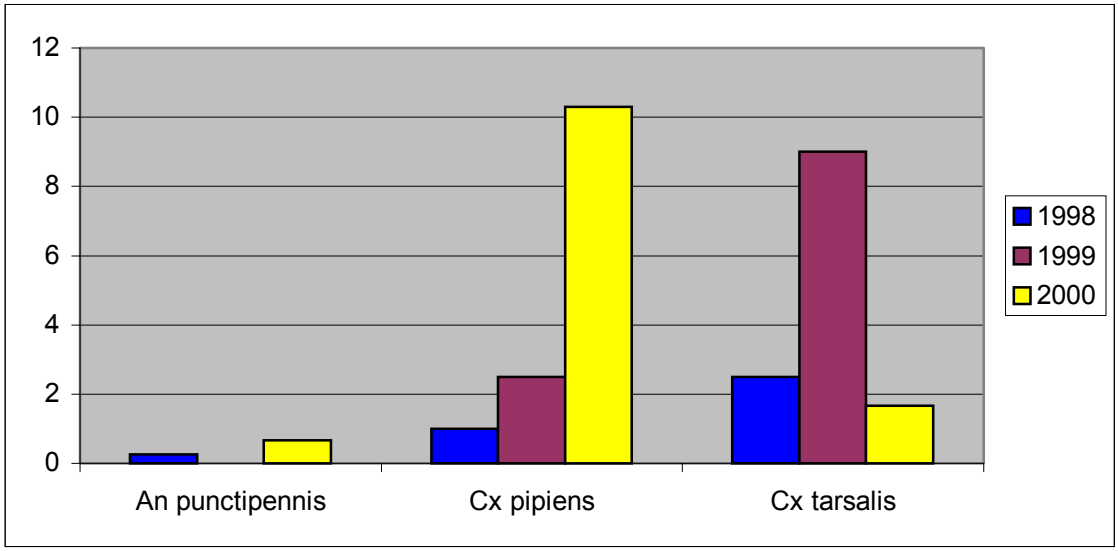


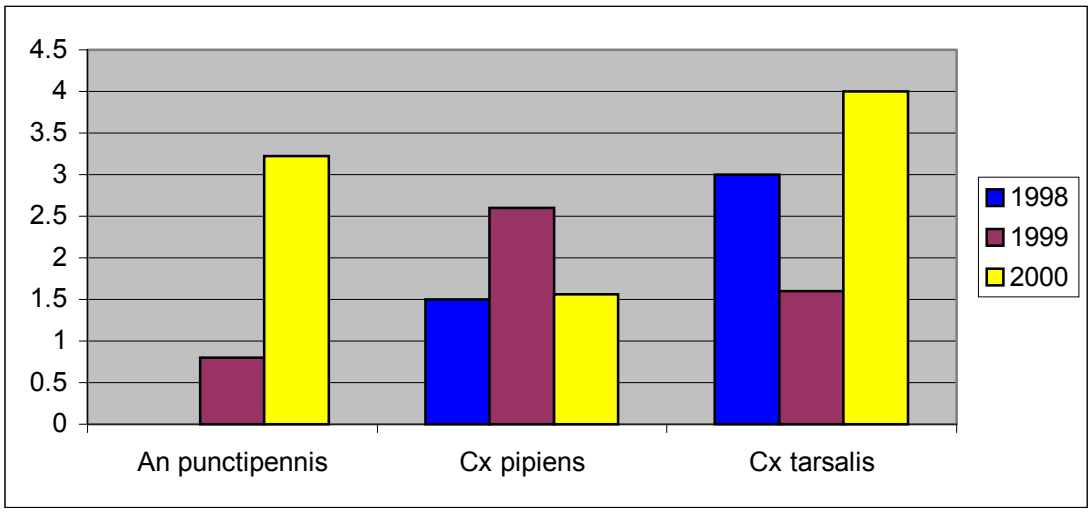
Figure 8. Average numbers of selected mosquitoes trapped in Camas.



A comparison of the numbers of floodwater mosquitoes trapped this season and last season is a bit misleading because no traps were set at the third street loop in 1999. In 1998 an average of 44 floodwater mosquitoes were trapped at the third street loop. This season 225 floodwater mosquitoes were trapped on average, much higher than elsewhere in the county. The average numbers of *Cx pipiens* (10.3) per trap was also much higher than elsewhere in the county.

The numbers of floodwater mosquitoes trapped in the Washougal area were practically non-existent this season; 1 *Ae vexans* was trapped on June 14th at index and 35th, and 1 *Ae vexans* was trapped on August 17th at SR14 and 32nd. On the other hand the summer mosquitoes *An punctipennis*, *Cx pipiens*, and *Cx tarsalis* were trapped consistently (Fig. 9) throughout the season. In 1998 no traps were set on the refuge

Figure 9. Average numbers of summer mosquitoes trapped in Washougal.



and in1999 the traps on the refuge were set later in the season than the traps set there this year so the comparison is misleading due to the seasonality of mosquitoes. One of the goals for next season is to set more traps on the refuge at regular interviews as was the case this year.

Encephalitis Surveillance

Due to time constraints and the numbers of mosquitoes trapped no samples were tested for St. Louis Encephalitis (SLE) or Western Equine Encephalitis (WEE) in 2000. At the end of this season funds from the Centers for Disease Control became available for research into the movement of West Nile Virus (WNV) from New York. Because of this the Oregon State Health Division will be using some of this money to outfit their lab to test mosquitoes for SLE, WEE, and WNV. One of the goals will be to test a variety of mosquito species instead of only testing *Cx tarsalis* as is currently happening. We will be testing *Cx pipiens*, *Ae vexans* and *Ae sticticus* to better monitor for the viruses as they may appear here.

Conclusion

Primarily, two things worked in favor of mosquito control along the lower Columbia River during the 2000 season. The first was the minimal flooding event, the river seemed to peek once, thereby minimizing the acreage needing to be treated. The second advantage was the use of the helicopter. Both factors appeared to have assisted in keeping the numbers of mosquitoes produced this season low. One interesting occurrence was that for the first time more *Ae vexans* were collected than *Ae sticticus*. This could be a timing issue. Other species trapped erratically and in low numbers included *Ae sierrensis*, *Ae woshinoi*, *Culesita inornata*, *Cs incidens*, and *Cq perturbans*.

The seasonal trends for floodwater mosquitoes over the last three seasons are very similar. Floodwater mosquitoes (Fig. 10) seemed to peak in July as they did the two years previously. They dropped significantly in August and all but disappeared in September. The trends for the summer mosquitoes (Fig. 11) are not quite as predictable. Because they produce several generations each year their numbers are based on the availability of water, which can change significantly with a heavy rain. One explanation for the numbers could be that during a high flood season they use the floodwater to produce their first few generations.

Figure 10. Seasonal trends for the last three years.

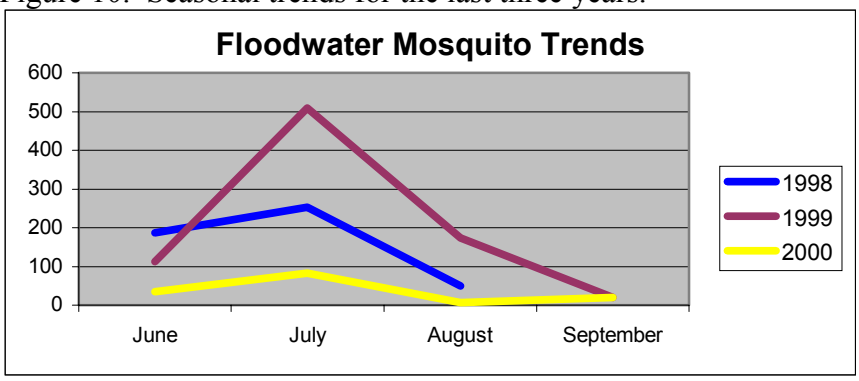
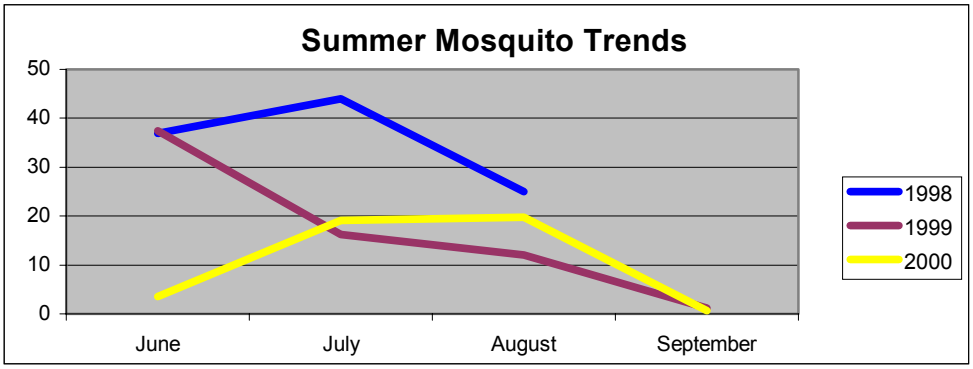


Figure 11. Seasonal trends for summer mosquitoes.



This year with the low flooding there may not have been enough water around long enough in those areas to get high numbers in June. The higher numbers in July and August could be attributed to finding locations closer to smaller more permanent sites than floodwater.

Next season it is important to continue to trap some of the known hotspots, including Ridgefield Wildlife Refuge and Vancouver Lake. It would also be interesting to see exactly when adult mosquitoes begin to be active by trapping earlier in the season. Another benefit would be to routinely trap the new areas found this season including the Water Resources area and Vanalco. These two areas in particular appear to be located near relatively new manmade larval sources. The new sites are undergoing changes that will impact the numbers of mosquitoes produced over the next few years.